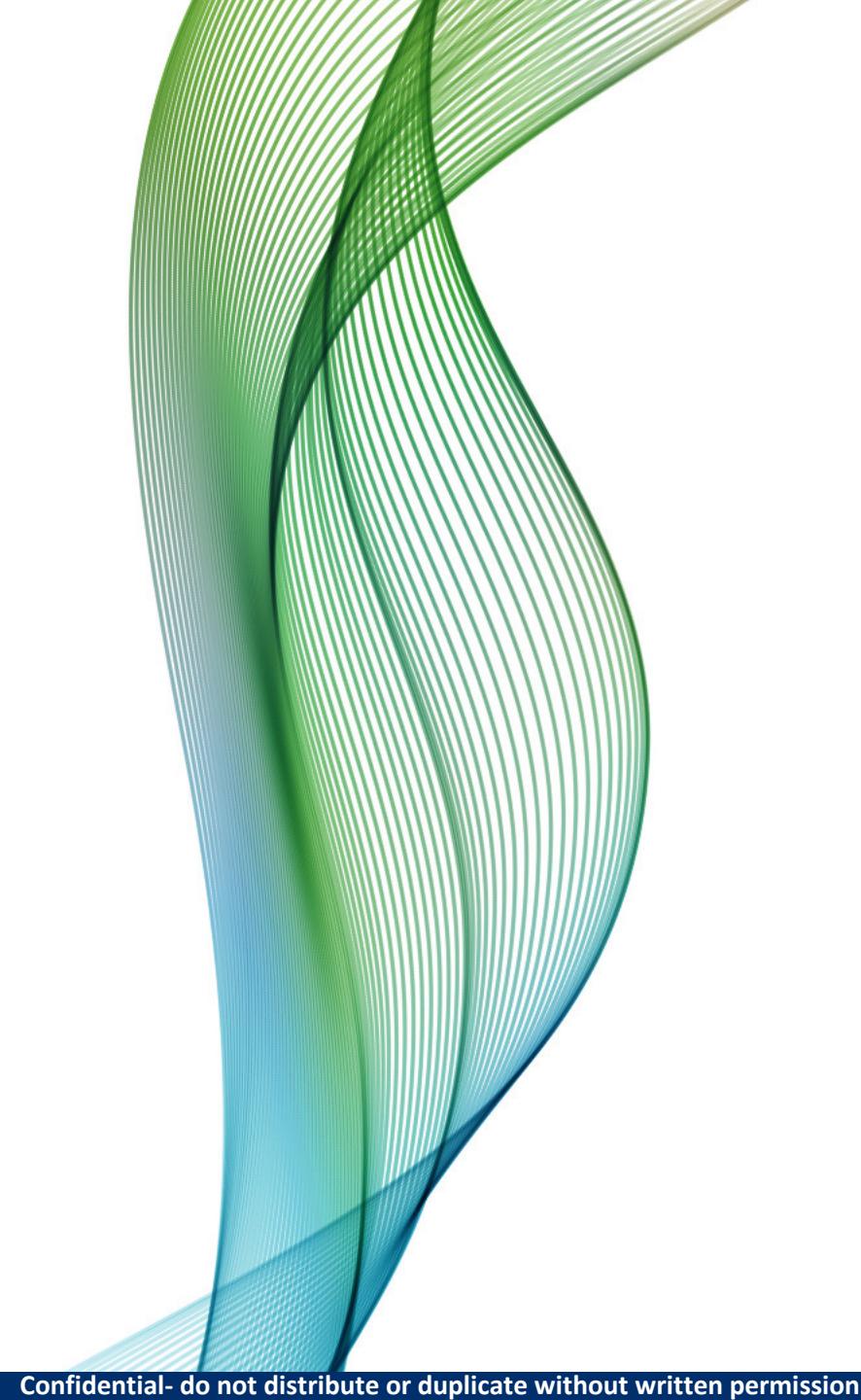




Internship 2022

Ehsan Al-Agtash

Aug 18th, 2022



Overview

Introduction

Projects

Things I
learned

Takeaways

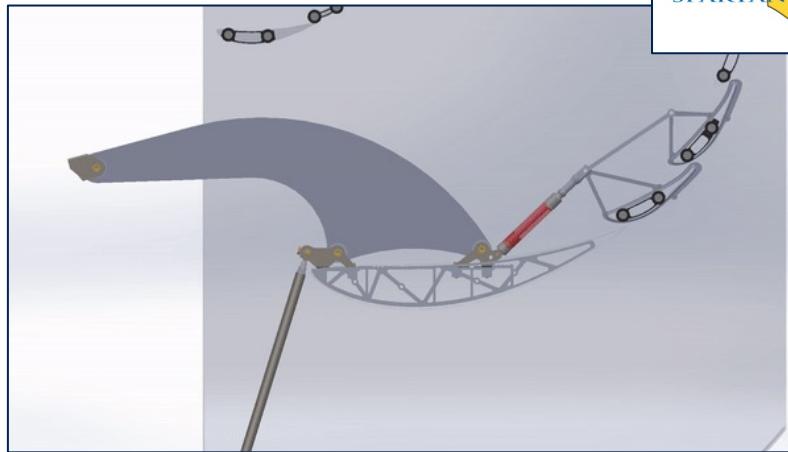
Introduction

About Me



Charles W. Davidson College of Engineering
Department of Mechanical and Aerospace Engineering

- ▶ San Jose State University
 - ▶ Graduating in December 2022
 - ▶ B.S. in Mechanical Engineer
 - ▶ Why mechanical?
 - ▶ Spartan Racing Team

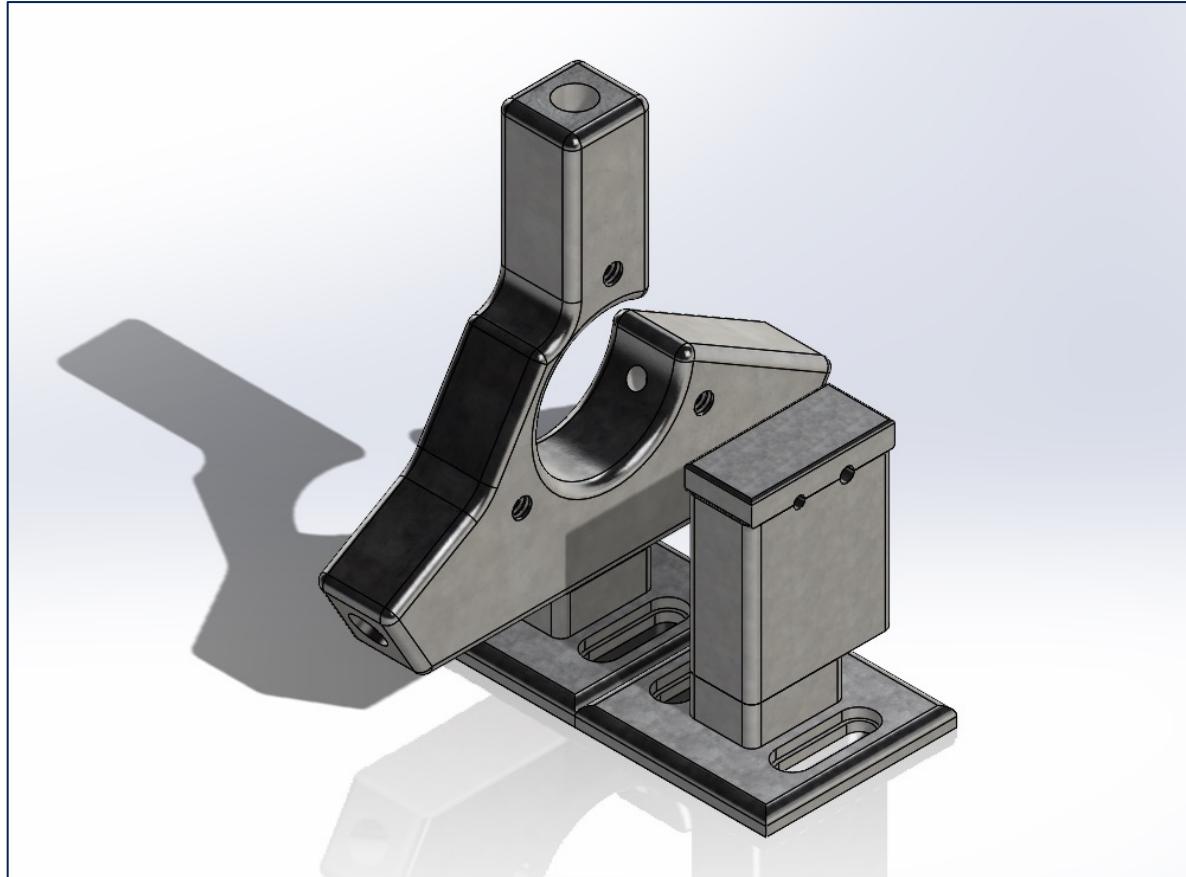


- ▶ Hobbies
 - ▶ Surfing
 - ▶ Hiking
 - ▶ Camping
 - ▶ Snowboarding



Projects

UV curing station



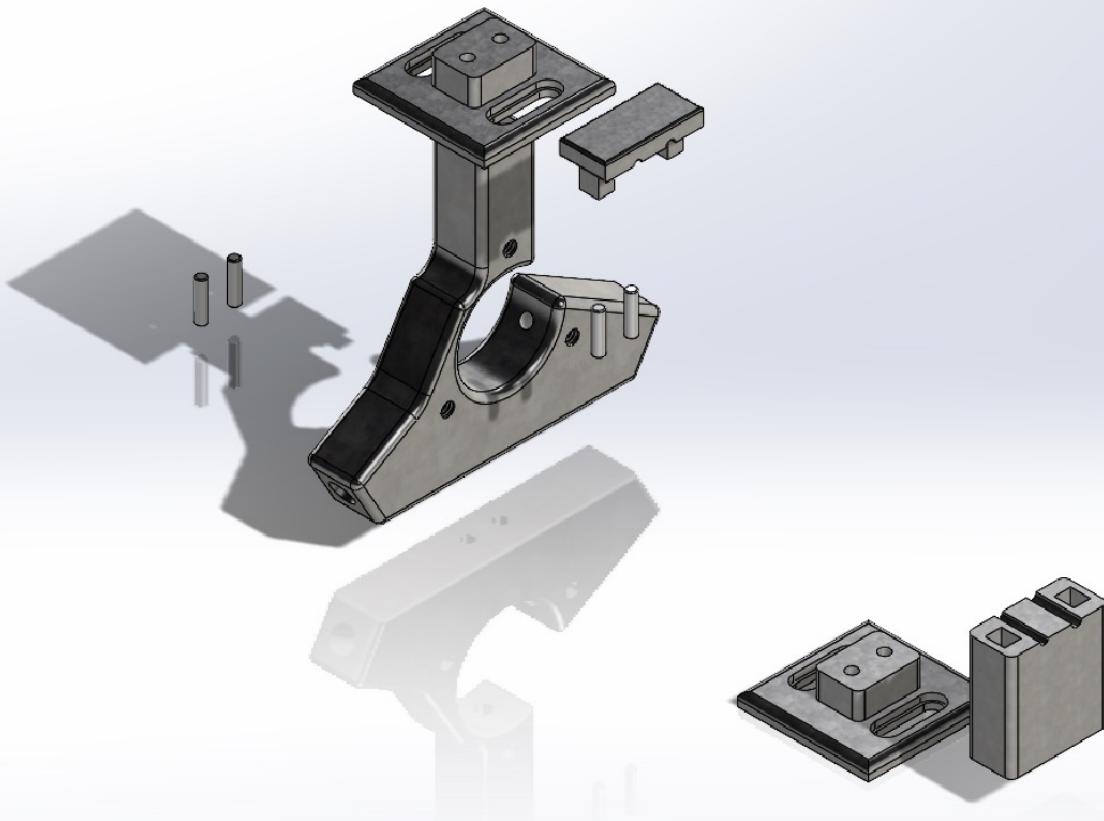
► Problem:

- ▶ Inconsistent results with curing throughout manufacturing
- ▶ Issues of Burning and the adhesive not fully curing

► Challenges:

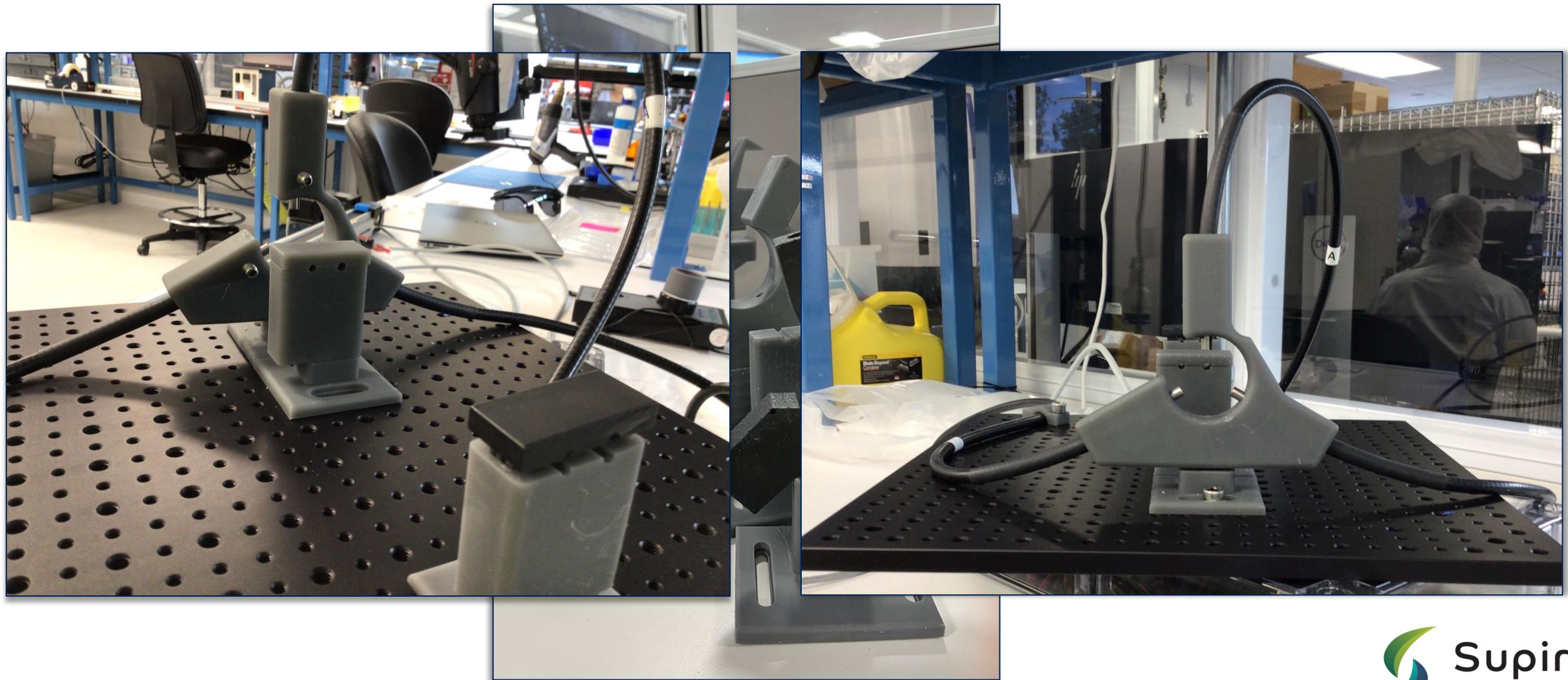
- ▶ Operator usability
- ▶ Height / Space constraints
- ▶ Cables bending radius

UV curing station



Design

Where it's at now

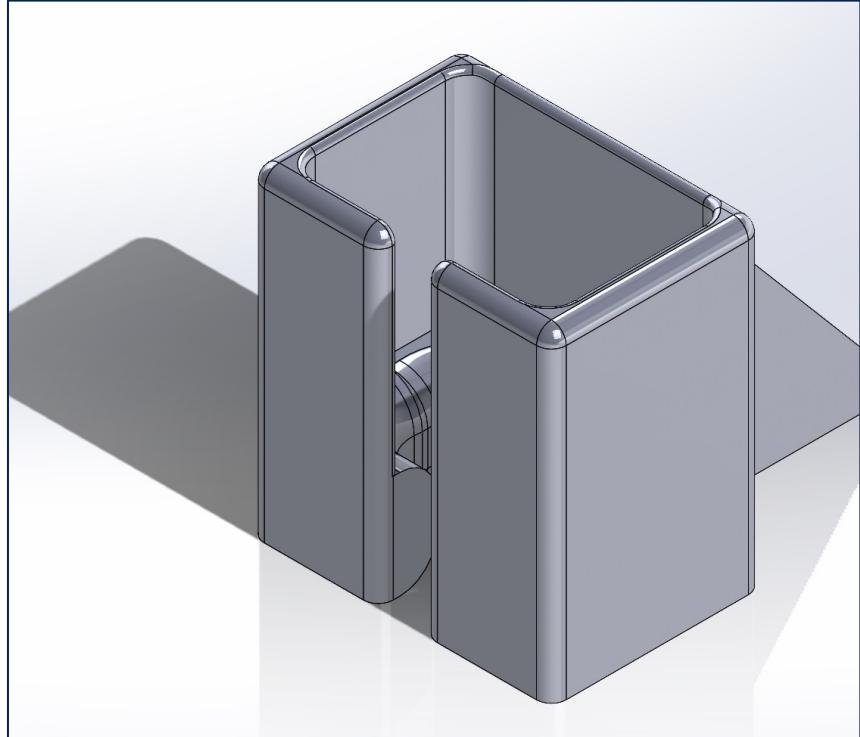


UV curing station

- ▶ Testing:
 - ▶ DOE to explore process inputs
 - ▶ Vary cure time and UV distance
- ▶ Other Findings:
 - ▶ The storage temp of the Loctite 3311 matters
 - ▶ The further the distance the less burn risk
 - ▶ Volume of Loctite matters

Distance of the wands being extruded (cm)	Time (seconds)						Tube OD (In)
	2	4	6	8	10	12	
0.5	Not cured	Not cured	Clear/sticky	Clear	Clear	Burnt/bubbly	0.11
0.75	Not cured	Not cured	Clear/sticky	Clear/sticky	Clear/fully cured	Burnt/bubbly	0.11
Distance of wands being extruded (cm)	Time (seconds)						Tube OD (In)
	2	4	6	8	10	12	
0.5	Not cured	Not cured	Clear/sticky	Clear/sticky	Clear/sticky	Clear/fully cured	0.14
0.75	Not cured	Not cured	Clear/sticky	Clear/fully cured	Burnt/bubbly	N/A	0.14
1	Not cured	Not cured	Clear/sticky	Clear/sticky	Clear/fully cured	Burnt/Bubbly	0.14

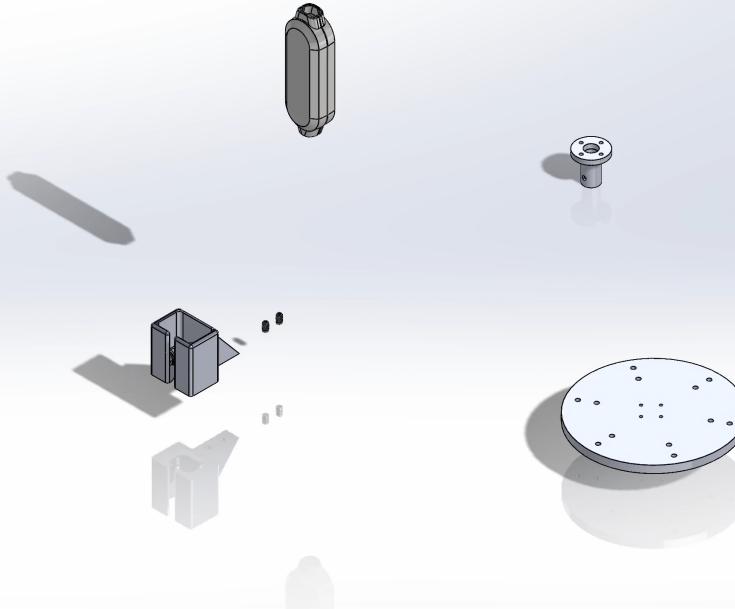
Device Dryer



- ▶ Problem
 - ▶ No where to place Supira device after testing
 - ▶ Devices weren't drying completely
- ▶ Challenges
 - ▶ Mounting
 - ▶ Desk holes weren't centered
 - ▶ Enough room

Device Dryer

Design



Where it's at now



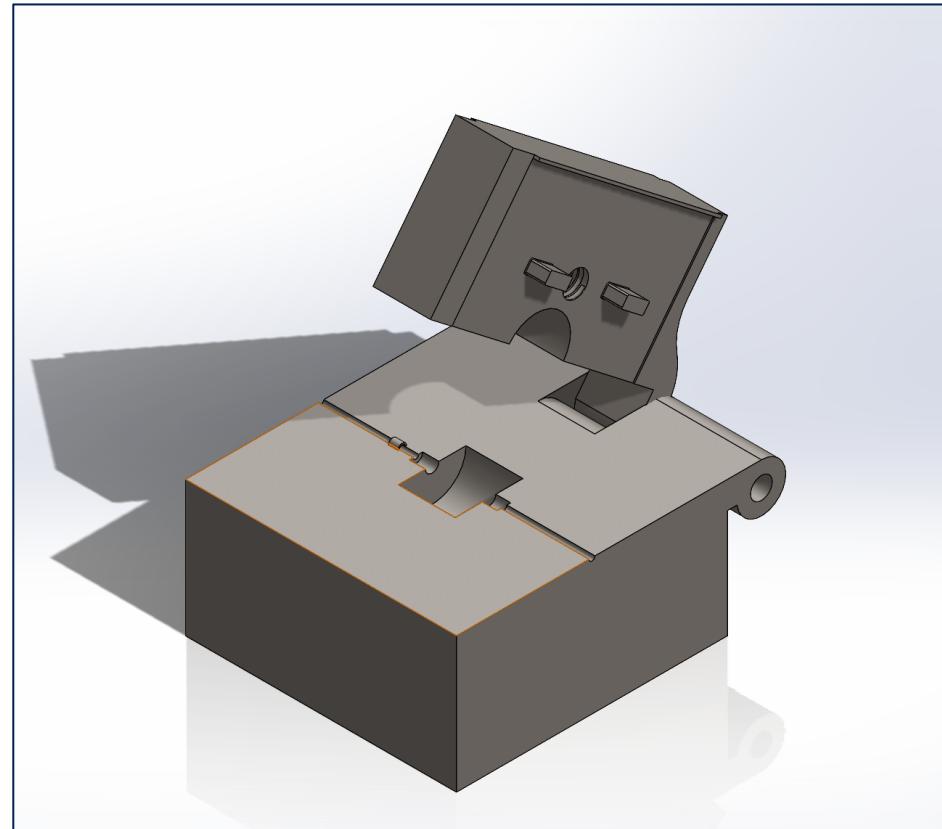
Impeller trimming fixture

- ▶ Problem:
 - ▶ Inconsistency of trimming the impellers to the appropriate location
- ▶ Challenges:
 - ▶ Small part
 - ▶ Very tight tolerances
 - ▶ Part flexibility
 - ▶ Small measurements

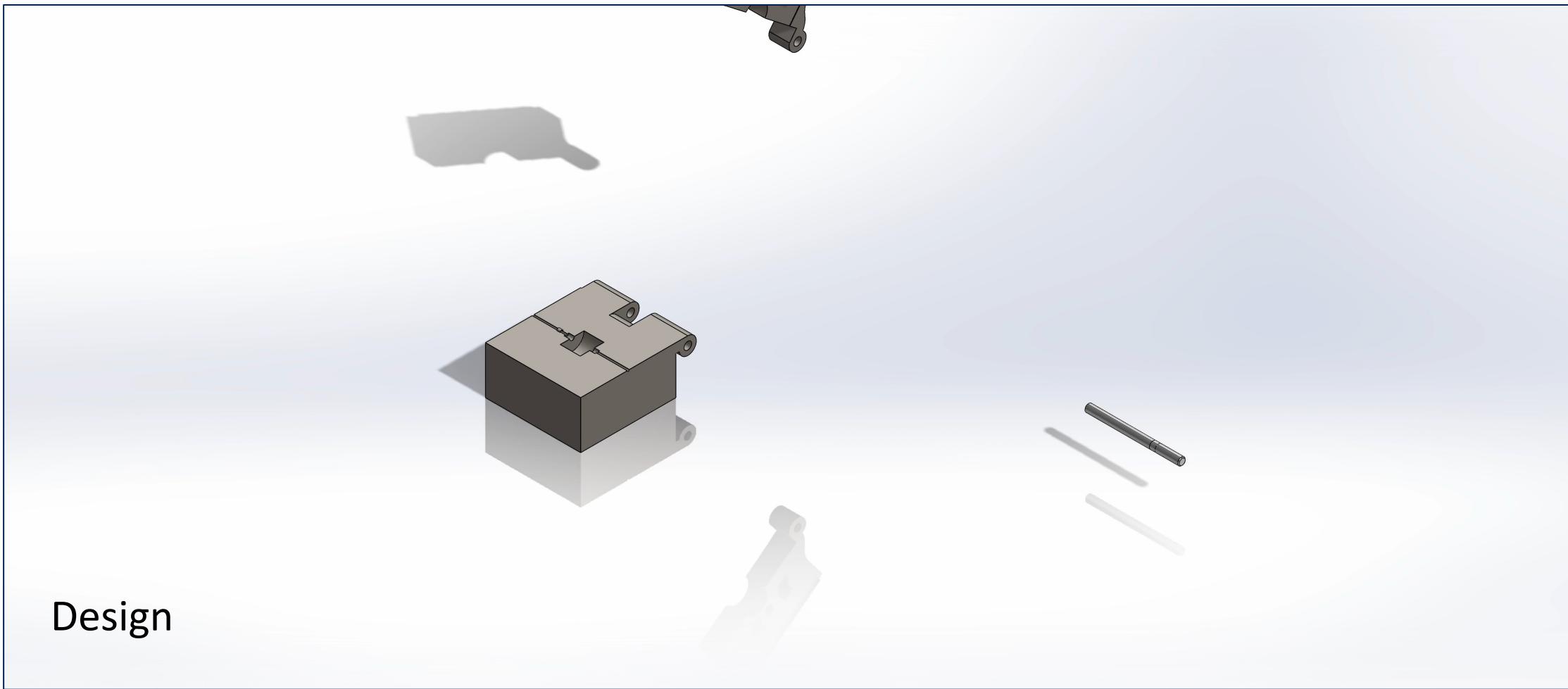


Impeller trimming fixture

- ▶ Testing:
 - ▶ An accurate trim from both sides of the impeller
 - ▶ IQ after each trim
- ▶ Results:
 - ▶ TBD

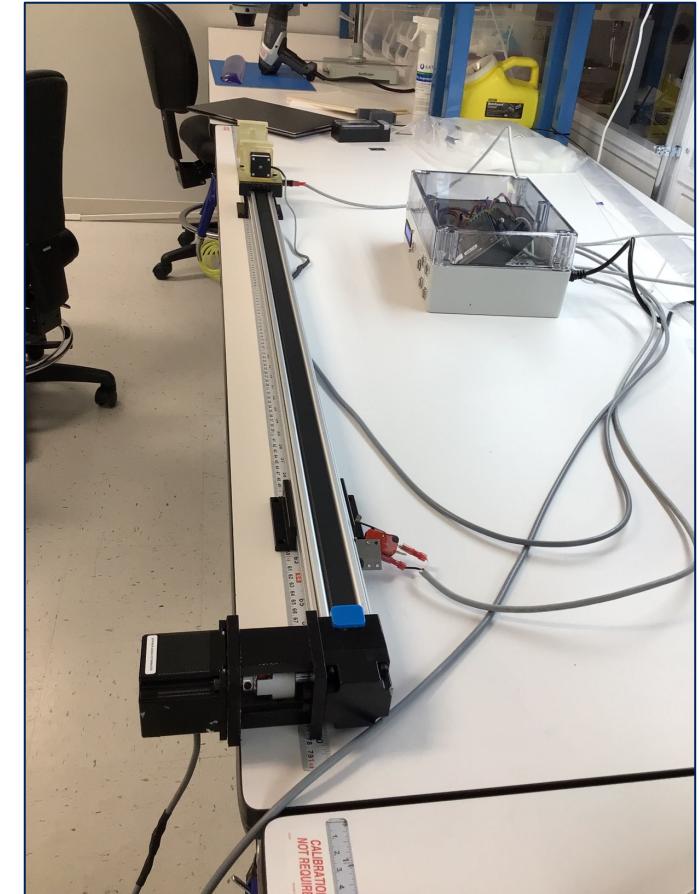
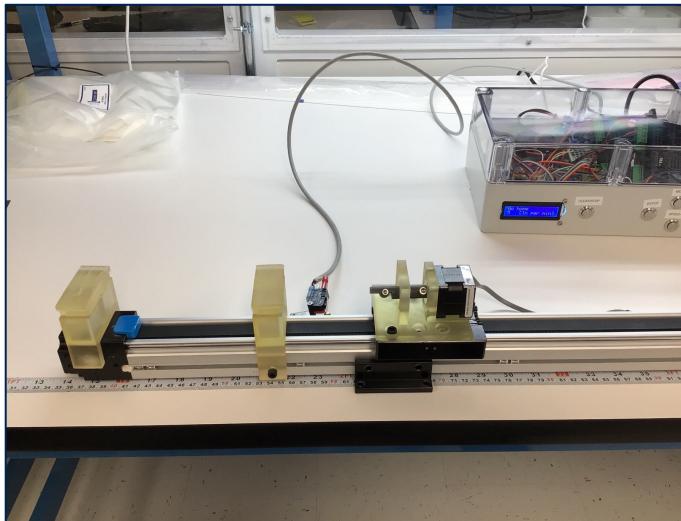


Impeller trimming fixture



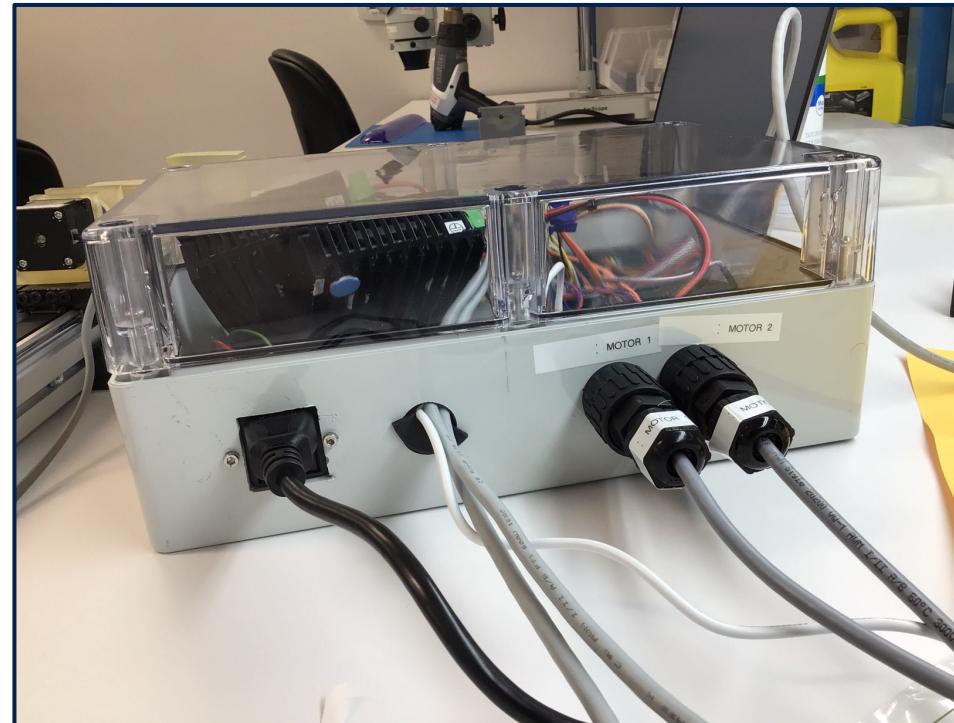
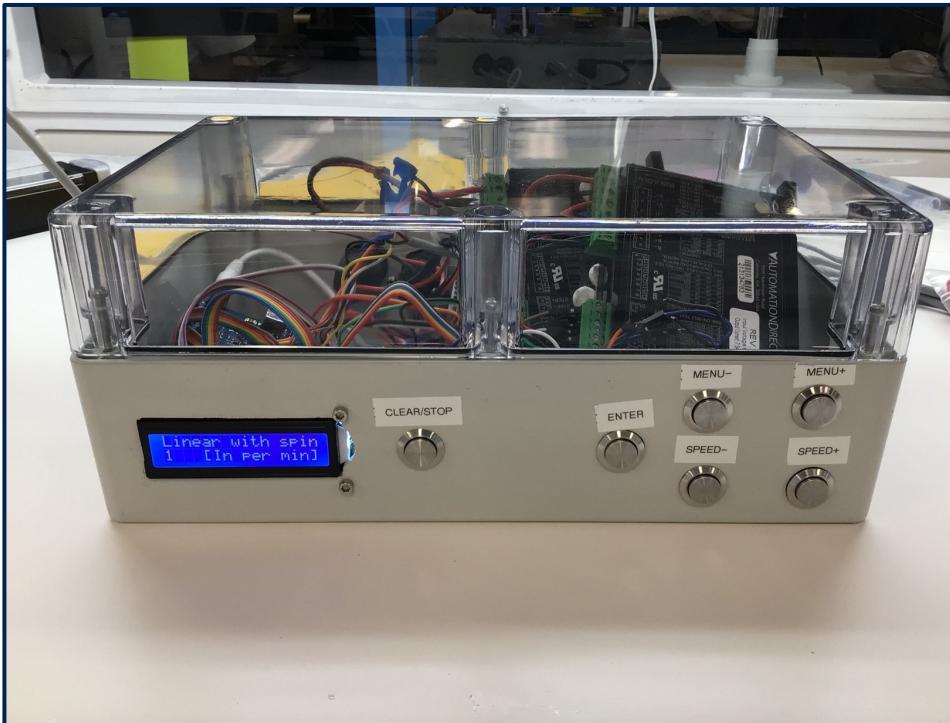
Linear Coil Winder

- ▶ Need:
 - ▶ Multiple processes require it & takes a lot of time (bottle neck)
- ▶ Challenges:
 - ▶ Sourcing parts
 - ▶ Running two stepper motors at different speed at the same time
 - ▶ Cable management
 - ▶ Documentation
 - ▶ Validating against existing winder



Linear Coil Winder

- ▶ Results:
 - ▶ Design improvement
 - ▶ Operators buy in was a success
 - ▶ Currently ready for use by the operators
 - ▶ Efficient coding



What I've learned

Observed and learned the stage of a startup

From DV to first in human

A deeper understanding of R&D, Process development and operations work

Efficiency is important

Avoiding measurement mistakes

Tips and tricks on everyday task or long-term tasks